IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s):	Fischer et al.
Case:	45-14-2
Serial No.:	10/719,655
Filing Date:	November 21, 2003
Group:	2627
Examiner:	Glenda P. Rodriguez
Title:	Magnetic Storage Write Heads Using Micro-Electro Mechanical Shutters

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APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants hereby appeal the final rejection dated July 26, 2006, of claims 1 through 20 of the above-identified patent application.

REAL PARTY IN INTEREST

The present application is assigned to Agere Systems Inc., as evidenced by an assignment recorded on March 31, 2004 in the United States Patent and Trademark Office at Reel 015168, Frame 0928. The assignee, Agere Systems Inc., is the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 1 through 20 are presently pending in the above-identified patent application. Claims 1-20 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Claims 1-20 are being appealed.

STATUS OF AMENDMENTS

There have been no amendments filed subsequent to the final rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 is directed to a magnetic storage system, comprising: at least one write coil (110) to generate a magnetic field (120) for at least a plurality of bit intervals (page 3, lines 1-30; page 4, line 23, to page 6, line 30); a magnetic storage medium (150); and at least one shutter (200) to selectively allow said magnetic field to alter a magnetic domain of said magnetic storage medium (page 3, line 16, to page 6, line 27).

Independent claim 10 is directed to a method for recording information in a magnetic storage medium, said method comprising the steps of: generating a magnetic field for at least a plurality of bit intervals (page 3, lines 1-30; page 4, line 23, to page 6, line 30); and selectively allowing said magnetic field to alter a magnetic domain of said magnetic storage medium for each bit interval by utilizing a shutter (page 3, line 16, to page 6, line 27).

Independent claim 14 is directed to a write head for a magnetic storage system, comprising: at least one write coil to generate a magnetic field for at least a plurality of bit intervals (page 3, lines 1-30; page 4, line 23, to page 6, line 30); and at least one shutter to selectively allow said magnetic field to alter a magnetic domain of a magnetic storage medium (page 3, line 16, to page 6, line 27).

STATEMENT OF GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-20 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement.

ARGUMENT

The Examiner asserts that the Specification does not address "how the medium is **attached** and how the medium **behaves** when it is allowing or inhibiting the magnetic flux of the write coil" (emphasis added). The Examiner further asserts that the "descriptions are insufficient for one of ordinary skill in the art to understand how is this 'shutter' working in the head in order to selectively allow the magnetic field to alter this magnetic domain."

As indicated in Appellants' prior response, Appellants do not allege to have invented a shutter system. In fact, shutters were well known to those of ordinary skill in the art at the time the present application was filed. MEMS shutter arrays were available commercial products at the time the application was filed. See, for example, http://www.electronicproducts.com/ShowPage.asp?SECTION=3700&PRIMID=&FileName=sepOL1.sep2003 (describing a MEMS-based light manipulation technology for display and other light manipulation applications), attached as an Exhibit hereto. Please note the date tag in the URL of September 2003 and the present filing date of November 2003. This commercial shutter array is a matrix of "flipping pixels" that can be opened or closed to allow light through. The documentation associated with such a commercial shutter system would clearly describe how to open or close the shutter.

The Examiner asserts that Appellants do not "specify under which conditions the 'shutter' is activated or enabled to selectively allow or block the magnetic field." Appellants submit that the specific conditions under which the shutter is activated or enabled to selectively allow or block the magnetic field is a design choice, influenced by the particular shutter selected. The composition of the shutter is addressed further below.

The present invention is directed to selectively altering the magnetic domain of a magnetic storage material 150 by controlling the path of a magnetic field 120 *using* one or more shutters 200. In the disclosed magnetic storage system of the present invention, a person of ordinary skill in the art would understand, based on the present disclosure and the commercial availability of such shutter arrays, how to open or close the shutter to selectively allow a magnetic field to alter a magnetic domain of the magnetic storage medium.

In this regard, the present specification teaches:

> In an open position of the shutter 200, the magnetic field 120 is allowed to pass the shutter 200 and will follow an outer loop 130 comprised of magnetic material segments 132, 134, 136 and the magnetic storage material 150. In a closed position of the shutter 200, the magnetic field 120 is not allowed to pass the shutter 200 and will follow an inner loop 140 that bypasses the disk 150 and is comprised of magnetic material segments 132, 134, 136 and 138. In this manner, the magnetic domain of the magnetic storage medium 150 is selectively altered based on the position of the shutter 200.
> (Original Specification, at page 3, lines 18-24.)

FIG. 2, and the corresponding text on page 4 of the specification, illustrate an exemplary shutter array 200. In this regard, the present specification teaches how the shutter array is *constructed* and how it *operates*:

> As shown in FIG. 2, each shutter element 210 can *pivot across a central axis* between an open (not shown) and closed position (shown), in a *similar manner to a venetian blind*. The position of each shutter element 210 can be *controlled*, for example, *using micro electro mechanical systems (MEMS) or other micromachine control elements*. It is noted that micro electro mechanical systems switches are **increasingly used** for optical networks and other applications. In an optical network application, MEMS switches have been employed, for example, to move a mirror that changes the propagation direction of light, or blocks the light entirely. United States Patent Number 5,974,207, for example, discloses a wavelength-selective add-drop multiplexer that uses movable mirrors to add and/or drop spectral components from a

> wavelength-division-multiplexed optical signal. *Magnetic shielding may be implemented using Nickel (Ni) metallization or Cobalt (Co) deposition on the shutter mechanisms 210.* In this manner, when the shutter elements 210 are in a closed position, the magnetic field will be reflected to the inner loop 140.
> (Original Specification, at page 4, lines 3-15; emphasis added.)

Shutter Operation (Behavior)

As indicated in the above passage, MEMS devices were well known and already frequently used for other applications at the time of the filing of the present application. United States Patent Number 5,974,207 describes using a MEMS-based actuator to move an optical device, such as a mirror, into, and out of, the path of an optical signal. The operation of the shutter for magnetic applications would be obvious to a person of ordinary skill in the art, based on the teachings of the present invention, United States Patent Number 5,974,207, as well as commercially available shutter devices.

Thus, contrary to the assertion of the Examiner, the present specification gives clear guidance on how the shutters behave. In the above-described exemplary embodiment, the shutters are mounted in an array, such that they can pivot across a central axis between an open and closed position. The pivoting is controlled using MEMS devices which were very well known to those of ordinary skill in the art at the time of filing, as evidenced by U.S. Patent No. 5,974,207 which was cited in the original filing.

Shutter Construction (Shutter Attachment)

Again, in the above-described exemplary embodiment, the shutters are fabricated in an array, such that they can pivot across a central axis between an open and closed position. Such a configuration was very well known to those of ordinary skill in the art at the time of filing. See, for example, the commercial shutter array product referenced above and attached hereto. The pivoting arrangement indicates how the shutters are *attached*.

With regard to the *composition* of the shutters themselves, the original specification teaches that the shutters can be coated with a magnetic shielding, such as Nickel or Cobalt. See

Cobalt. See page 4, lines 12-13. See also, claims 7-9.

Conclusion

Appellants submit that the claimed subject matter is described in the original specification in such a way as to enable a person of ordinary skill in the art to make and use the invention without undue experimentation. Thus, Appellants respectfully request withdrawal of the rejection of claims 1-20 under 35 U.S.C. §112, first paragraph.

The attention of the Examiner and the Appeal Board to this matter is appreciated.

Respectfully,

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Date: January 11, 2007

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APPENDIX

1. A magnetic storage system, comprising:

at least one write coil to generate a magnetic field for at least a plurality of bit intervals;

a magnetic storage medium; and

at least one shutter to selectively allow said magnetic field to alter a magnetic domain of said magnetic storage medium.

2. The magnetic storage system of claim 1, further comprising at least one magnetic pole segment to provide a loop between said at least one write coil and said magnetic storage medium.

3. The magnetic storage system of claim 1, comprising a first write coil to generate a positive magnetic field, a second write coil to generate a negative magnetic field, and at least two shutters to selectively allow said positive or negative magnetic fields to alter said magnetic domain of said magnetic storage medium.

4. The magnetic storage system of claim 3, wherein said positive or negative magnetic fields alter said magnetic domain in a collocated region of said magnetic storage medium.

5. The magnetic storage system of claim 3, further comprising a first set of magnetic pole segments to provide a first loop between said first write coil and said magnetic storage medium and a second set of magnetic pole segments to provide a second loop between said second write coil and said magnetic storage medium.

6. The magnetic storage system of claim 1, wherein a position of said shutter is adjusted using a micro-electro mechanical system.

7. The magnetic storage system of claim 1, wherein at least one of said shutters is coated with a magnetic shielding.

8. The magnetic storage system of claim 7, wherein said magnetic shielding is comprised of Nickel.

9. The magnetic storage system of claim 7, wherein said magnetic shielding is comprised of Cobalt.

10. A method for recording information in a magnetic storage medium, said method comprising the steps of:

generating a magnetic field for at least a plurality of bit intervals; and

selectively allowing said magnetic field to alter a magnetic domain of said magnetic storage medium for each bit interval by utilizing a shutter.

11. The method of claim 10, further comprising the steps of generating a positive magnetic field and a negative magnetic field, and selectively allowing said positive or negative magnetic fields to alter said magnetic domain of said magnetic storage medium.

12. The method of claim 11, wherein said positive or negative magnetic fields alter said magnetic domain in a collocated region of said magnetic storage medium.

13. The method of claim 10, wherein said step of selectively allowing said magnetic field to alter a magnetic domain is performed by at least one shutter and said method further comprises the step of adjusting a position of said shutter using a micro-electro mechanical system.

14. A write head for a magnetic storage system, comprising:

at least one write coil to generate a magnetic field for at least a plurality of bit intervals; and

at least one shutter to selectively allow said magnetic field to alter a magnetic domain of a magnetic storage medium.

15. The write head of claim 14, further comprising at least one magnetic pole segment to provide a loop between said at least one write coil and said magnetic storage medium.

16. The write head of claim 14, comprising a first write coil to generate a positive magnetic field, a second write coil to generate a negative magnetic field, and at least two shutters to selectively allow said positive or negative magnetic fields to alter said magnetic domain of said magnetic storage medium.

17. The write head of claim 16, wherein said positive or negative magnetic fields alter said magnetic domain in a collocated region of said magnetic storage medium.

18. The write head of claim 16, further comprising a first set of magnetic pole segments to provide a first loop between said first write coil and said magnetic storage medium and a second set of magnetic pole segments to provide a second loop between said second write coil and said magnetic storage medium.

19. The write head of claim 14, wherein a position of said shutter is adjusted using a micro-electro mechanical system.

20. The write head of claim 14, wherein at least one of said shutters is coated with a magnetic shielding.

EVIDENCE APPENDIX

There is no evidence submitted pursuant to § 1.130, 1.131, or 1.132 or entered by the Examiner and relied upon by appellant.

RELATED PROCEEDINGS APPENDIX

There are no known decisions rendered by a court or the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of 37 CFR 41.37.